

constructing a plurality of surfaces within the scene, each surface consisting of a plurality of points; and

approximating an illumination effect of all of the finite light sources by the use of a single point light source of varying intensity.

REMARKS

The Office Action dated June 20, 2001 has been received and carefully noted. The above amendment and the following remarks are submitted as a full and complete response thereto. Claims 1 has been amended to more particularly point out and distinctly claim the present invention. No new matter has been added. Claims 1-10 are respectfully submitted for consideration.

Applicant wishes to thank the Examiner for indicating the allowance of claims 7-10. Applicant also wishes to thank the Examiner for conducting a telephone interview with Applicant's representative interview on July 11, 2001. The discussions were helpful and Applicant submits the amended claim 1 in view of that discussion.

Claims 1-6 remain rejected under 35 U.S.C. §103(a) as being unpatentable over *Nishita et al.* ("Continuous Tone Representation of Three-Dimensional Objects Illuminated by Sky Light", Computer Graphics, Vol. 20, No. 4, August 1986) in view Persistence of Vision[®]'s Ray-Tracer software ("POV-Ray", 1997). The above rejection is respectfully traversed based on the remarks that follow.

In reviewing the subject Office Action, it appeared that the Office was interpreting the claims in a manor that differed from Applicant's intent, based on the prior changes to claim 1. The Office Action states that "POV-Ray does not disclose the approximation of

the illumination effect of each of the finite light sources of varying intensity, or a hemispherical light source, by use of a plurality of point light sources.”

Claim 1 previously recited, in part, “approximating an illumination effect of each of the finite light sources *by the use of a single point light source*.” Applicant previously asserted that *Nishita et al.* does not teach or suggest taking into account the illumination effect of the finite light sources through the use of a single point light source. *Nishita et al.* uses regular slices or bands of the hemisphere and there is no appreciation for the use of point light sources. In fact, the Office Action acknowledges that *Nishita et al.* fails to positively disclose the use of point light sources.

Through the course of the telephone interview, the Examiner indicated that the claim was being read as each finite light source being approximated by a point light source, i.e., a one-to-one correspondence between finite and point light sources. However, as discussed in the specification of the present application, the present invention allows the animator to approximate the illumination effect of a finite light source by using a point source of varying location and intensity. Claim 1 has been amended such that it recites that all of the finite light sources are approximated by a single point light source.

The POV-Ray reference fails to teach the use of a single point light source to accomplish that approximation. Given the lack of disclosure, Applicant respectfully asserts that the claim 1, and claims dependent thereon, would not have been obvious in view of the *Nishita et al.* and the POV-Ray reference.

In addition, the rejection fails to consider or overcome the indicia of nonobviousness provided in the specification and discussed in Applicant's previous

response. When evidence of any secondary considerations is submitted, the Examiner must evaluate the evidence. M.P.E.P. 2141.

The rejection alleges, in effect, that the POV-Ray software, coupled with *Nishita et al.*, can approximate the effect of any type of area light source and that such approximation is an obvious extension of *Nishita et al.* However, if such an extension were obvious, it would be in widespread use throughout the industry. This is due to the fact that the cost of implementing a spherical pseudo area light is virtually nil, and the effect is much more realistic illumination. The pursuit of realism and lower computational cost are the two dominant driving forces in the industry. The fact that such an implementation, which addresses both these goals, does not exist is a clear demonstration that such an extension is not obvious.

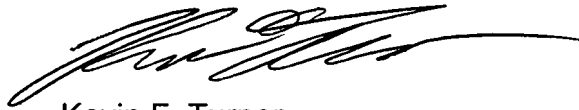
In addition, even if the references were somehow combined, they would not reduce computation time nor cost. As discussed above, the POV-Ray software teaches away from efficiency and instead emphasizes photo-realistic results. The combination of references cited in the rejection would not provide the benefits of the present invention. The Examiner is respectfully requested to consider the above noted benefits in reconsidering the prior rejections.

As such, Applicant respectfully asserts that the rejection of claims 1-6 is improper and should be withdrawn. Applicant also respectfully requests that the application be allowed to proceed to issue. If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicant's undersigned attorney at the indicated telephone to arrange for an interview to expedite this position of this application.

In the event this paper is not being timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to counsel's Deposit Account No. 01-2300.

Respectfully submitted,

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MARKED UP COPY OF REWRITTEN MATERIAL

1. (Amended) A method for illuminating surfaces in computer graphics comprising the steps of:

constructing a plurality of finite light sources within a computer animated scene, each of the finite light sources having a finite size and a center;

constructing a plurality of surfaces within the scene, each surface consisting of a plurality of points; and

approximating an illumination effect of [each] all of the finite light sources by the use of a single point light source of varying intensity.